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# Have Dutch Municipalities Become More Efficient in Managing the Costs of Social Assistance Dependency?

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and

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## **Abstract\*\***

Many welfare reforms undertaken in OECD-countries are directed towards enhancing efficiency in the administration and implementation of social security and social benefits. In this perspective the governance reforms in The Netherlands are an example of decentralisation through budgeting of means to municipalities. This brings about a unique twofold experiment in which we compare the efficiency changes in providing social assistance as a result of decentralisation and budgeting and the influence of policy measures at a local level. By using data envelopment analysis we assess the effect of the introduction of the new Work and Social Assistance Act (WSA) in 2004 on cost efficiency. By using a stochastic frontier analysis we assess the impact of municipal policy strategies on cost inefficiencies for the period 2005-2007. We find a clear positive effect of the WSA in 2004 on cost efficiency. Furthermore, we find that in the aftermath, when efficiency slowly dropped after 2005, there is a distinct impact of policy strategies municipalities adopt. Pursuing a strategy of activation raised efficiency significantly, whereas strict control or combinations of strategies led a (weak) fall in efficiency.

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## 1. Introduction

Decentralisation of national government policies to local levels is often justified by a need to improve efficiency. It prevents agency problems between national and local governments and local governments can better adapt policy measures to local needs, priorities and local partnerships (OECD, 2004, 1999). These arguments are the basic underlying reasons of the Dutch reforms in the administration of welfare and social benefits. The 2004 Work and Social Assistance Act (WSA) gives all municipalities full responsibility for activating and reintegrating the 340,000 social assistance clients they had in 2004. The main thing they cannot influence is the benefit level, since these are national standards. An important aspect of the WSA is the change in funding of municipalities. Instead of claiming all social assistance expenses directly from the central government, from 2004 onwards, local governments get a fixed budget to cover all social assistance expenses. The idea is that this will lead to a more efficient implementation of the welfare case load (Bosselaar et al. 2008; CPB, 2006). This new governance model creates incentives for reducing caseloads since money saved by municipalities, originally earmarked for benefits, can be transferred to other expenses. Municipalities also have more discretion in choosing measures for activating their beneficiaries (Tergeist & Grubb, 2006; Van Berkel, 2006).

But there is another aspect in this matter. Do municipalities actually have sufficient influence to prevent welfare dependency and promote outflow to the labour market? It is in this case not the question of how things have to be done, which is the main question in the public administration literature on decentralisation, but what has to been done (Van Berkel et al. 2007). The main conclusion in a substantial and growing body of evaluation literature on active labour market policy is that there are indeed effects of local policy instruments, but the net effects are in fact really small (Kluve, 2007; De Koning, 2007). Research on the effects of municipal policy measures on the in- and outflow of social assistance in the period 2004-2007 confirms the small influence of municipal policy (Broersma et al., 2009; Edzes et al., 2009).

So from these two perspectives the reforms of the Dutch welfare system gives a unique twofold insight. First, what have been the effects of decentralisation on the municipal cost efficiency of social assistance benefits? In other words, did the introduction of full budgeting in 2004 of the WSA have an effect on municipal cost efficiency of social assistance? It adds to the literature that is assessing the impact of public management reform, especially at the local levels of government and public services (Ter Bogt, 2008; Ridder, 2005). Second, what is the influence of local policy strategies on the efficiency? It contributes to the literature that is assessing the impact of instruments of active labour market policy (Card et al., 2009, Kluve et al., 2007).

The first question will be addressed for the period 2001-2007. The second question will be addressed for the shorter period 2005-2007. The main reason differentiating between two time periods is the fact that municipal policy strategies can only adequately be identified for the period 2005-2007.

In section 2 we first give a brief overview of the developments in the Dutch social security arrangements of the past two decades. Section 3 describes arguments in favour and against the expectations that these reforms lead to more efficiency. Section 4 goes into the specifics of identifying efficiency scores of municipal social assistance benefit costs. We will use two different strategies for this, each corresponding to our two sample periods. In the longer period 2001-2007, efficiency itself will be assumed to depend only on variables that act as inputs in the municipal cost process of social assistance. The annual cost efficiency indicators are determined by the distance of each municipal cost process to the efficient cost frontier. This frontier is determined in a so-called Data Envelopment Analysis (DEA). For the shorter period 2005-2007, cost efficiency is also determined by municipal inputs, but it is also linked explicitly to municipal policy strategies. This enables application of a Stochastic Frontier Analysis (SFA) to determine the cost frontier. Pros and cons of both methods will also be discussed in section 4. Section 5 discusses the data used and methodological set-up applied in this paper. Section 6 and 7 shows the empirical results and finally section 8 concludes.

## **2. Developments in social assistance**

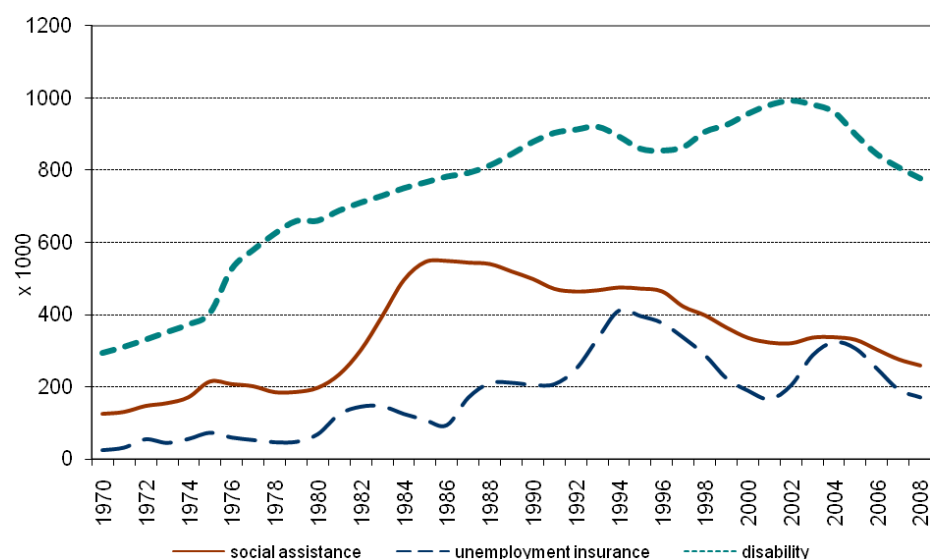
The past decades many OECD-countries made a transformation in their welfare states, mostly denoted 'from passive to active welfare states' or 'from welfare to workfare' (Brandt et al. 2005; OECD, 2003, 1999; Lødemel, 2000; Van Berkel, 2006). Although countries differ in their institutional arrangements, mainly because of different institutional and political roots and historical path dependencies, the underlying movement is the same everywhere (Brandt et al. 2005; OECD, 2003; Tergeist, 2006). In the Netherlands, the transformation started in the midst of the eighties, but the more fundamental institutional reforms in social security and manpower policies took place at the beginning of the nineties and comprise two central thoughts, namely activation as an overall strategy and privatisation with an emphasis on markets for the implementation (Van Gestel et al. 2009).

The Dutch system consists of social insurance benefits for unemployment and disability and social assistance benefits. For the social insurance benefits employers and employees pay an insurance premium from which benefits are paid in case of layoff or disability. Social insurance arrangements are nowadays carried out by an independent public corporation. Social assistance provides a social minimum income to those not (fully) eligible to any of the other arrangements. This type of benefit is

financed by the national government. Social assistance is nowadays completely decentralised to the municipality in which recipients live. The national government distributes fixed funds to municipalities from which they pay social assistance benefits.

Figure 1 shows the trend lines over the past 40 years for social insurance and social assistance benefits. The number of benefits for disability is by far the highest, reaching almost 1 million in 2002. From its outset in 1967, disability benefits have been on an increasing pace, particularly after the 1975 recession. This was caused by the option that partly disabled unemployed were entitled to obtain a full disability benefit, instead of a (lower) unemployment benefit. Even though this option was abolished in 1987, the upward trend remained until the first major reform in the early 1990's. This reform restricted eligibility and established an independent supervisory board. This immediately led to a drop in the number of disability benefit recipients. A much more extensive reform in 2002, focusing more on participation of disabled, than on mere income support, implied an even larger fall. Unemployment insurance benefits form the smallest, but most cyclical, social security arrangement. Eligibility depends on job duration of employees and this criterion was also tightened in a number of reforms. The number of social assistance benefits lies in between the other two. The recessions of the early 1980's caused an explosion in the number of social assistance benefits from 200 thousand in 1980 to 550 thousand in 1985. In fact, social insurance benefits are allocated to individuals, whereas a social assistance benefit pertains to the household an individual belongs to. When there are other household members with an income, this implies only a lower or no social assistance benefit will be granted.

**Figure 1. Main social security arrangements in The Netherlands: social assistance, unemployment insurance and disability, 1970-2008**



Source: Statistics Netherlands (own calculation)

The social assistance system has also been subject to reform in the past 15 years. We can split up these reforms into two lines. The first line refers to changes in the legal framework. Basically social assistance has evolved from a social income support system to a participation and unemployment provision (Geuns & Van Gent, 2007; Van Berkel, 2006). In 1996 the New Social Assistance Act for example sets a new legal framework in which the entitlements for social assistance were coupled to obligatory job search. From that point on the central thought is that employment goes before income. The role of social assistance changed to that of gate keeping, of individual activation contracts and the introduction of Workfirst-practices.

The second line had to do with the administration and implementation of social assistance. Basically, deregulation and decentralisation strengthen the administrative position of municipalities, which means they are better equipped in carrying out the social assistance arrangement. Until 2001 this arrangement still meant that municipalities could claim the expenses they made on behalf of social assistance benefits to the national authorities. In case there were more benefit recipients than anticipated, municipalities could simply claim the additional costs, in case there were less recipients they simply repaid the surplus. The rationale behind this was the premise that municipalities had no effect on the occurrence of unemployment and hence (in the end) social assistance (IBO, 1996). However, this way of financing social assistance implied no incentive for municipalities to limit inflow or stimulate outflow of these benefit recipients. The reforms in the financing scheme subsequently increase the financial responsibility of municipalities. First in 2001 when municipalities could claim 75% of the costs of social assistance from the national government. The remaining 25% was budgeted to them by the national government, based on criteria independent of the number of social benefit recipients and basically independent of municipal actions. Second, the 2004 WSA meant that 100% of the costs of social assistance and reintegration measures were budgeted to municipalities, based on socio-economic variables that take into account the demographic and regional labour market situation. Hence, when benefit costs exceed this budget, the municipality has to find other resources, which usually means less for other municipal measures. On the other hand, less benefit costs than budgeted, implies the full amount of this surplus is at the municipality's discretion.

Both legal and administrative reforms are directed towards a shift in social assistance from income support to stimulating participation and a shift in incentives to municipalities to limit inflow and stimulate outflow of social assistance benefits. These reforms finalised an ongoing decentralisation process in the execution of the social assistance provision in The Netherlands. The drop in social assistance benefits after 1996 and 2004 is usually connected to these reforms (see figure 1). Initial research over the period 2001-2004 suggests that these reforms increased the overall efficiency of the municipalities (CPB, 2006). It has led to less entry into

social assistance and more exits out of social assistance. (Ernst, 2008; Bosselaar et al. 2007; CPB, 2006). Table 1 shows that the total amount of expenditures on social assistance has declined from 4.3 billion in 2002 to 3.9 billion in 2007. In that same period the total volume of social assistance recipients declines from 322 thousand to 274 thousand.

**Table 1. Main indicators social assistance provision, 2002-2007**

	2002	2003	2004	2005	2006	2007
Total amount of expenditures social assistance (x mln. euro)*	4.159	4.432	4.186	4.202	4.243	3.759
Total amount of re-integration measures (x mln. euro)	1.958	1.783	1.458	1.363	1.373	1.373
Total volume of social assistance recipients (< 65 years of age) (X 1000)	320	336	338	328	301	274

\* Expenditures to recipients under 65 years of age.

From an international perspective the new incentive structure has stimulated a substantial decline in social assistance dependency as compared to other OECD-countries although the proportion of recipients at any moment in time remains high.

**Table 2. Shares of social assistance beneficiaries in the OECD  
(% of population of 15-64)**

	Type of programme	1990	1995	2000	2004	Diff. 2004-1990
Australia	Lone parent	2.2	2.7	3.1	3.3	+ 1.1
Canada	Social Assistance	2.1	2.9	1.7	...	
Denmark	Social Assistance	3.3	2.9	2.5	...	
Finland	Social Assistance	0.4	0.3	0.4	0.3	- 0.1
France	Social Assistance	1.7	2.9	3.2	3.4	+ 1.7
Germany	Social Assistance	2.1	2.2	2.2	2.5	+ 0.4
Ireland	Lone parent	1.6	2.7	3.4	3.3	+ 1.7
Japan	Social Assistance	0.3	0.3	0.3	0.4	+ 0.1
<b>Netherlands</b>	Social Assistance	<b>5.1</b>	<b>4.7</b>	<b>3.2</b>	<b>3.1</b>	<b>- 2.0</b>
New Zealand	Lone parent	4.3	4.3	4.3	4.1	- 0.2
Norway	Social Assistance	2.6	3.4	2.6	2.2	- 0.4
Portugal	Social Assistance	...	...	7.3	...	
Spain	Social Assistance	0	0.2	0.3	0.3	+ 0.3
Sweden	Social Assistance	1.3	2.1	1.9	1.7	+ 0.4
United Kingdom	Lone parent	2.2	2.9	2.4	2.0	-0.2
United States	Lone parent	2.3	2.5	0.9	0.6	- 1.7

Source: Carcillo & Grubb. 2006

The lump sum financing of benefits and reintegration means also renewed the role of municipalities in taking up a local labour market policy (Broersma et al, 2009; Edzes, 2008). After all, municipalities now have an intrinsic interest in preventing inflow and promoting outflow from social assistance, alone or together with other municipalities, public or private employment agencies and so on.

### **3. Efficiency of reforms in social assistance**

There are two main arguments why decentralisation should lead to more efficiency. The first reason has its origin in a rational institutionalist way of thinking, which is the basis for the new public management or neo-institutional economics (Ter Bogt, 2008; Scott, 2001; Hall & Taylor, 1996). Organizations are making rational choices between costs and revenues, are well-informed and in pursuit of efficiency. For instance, the agency-theory is explicitly used as argument for allocating means to municipalities (IBO, 1996). Because of information-asymmetry the national government cannot adequately control municipalities so local governments can easily shift the costs of social assistance benefits to national governments. This dilemma could be overcome by reinforcing the financial interest of municipalities for better implementation. In its turn, this should lead to more efficiency. Furthermore, this could also stimulate policy innovation, because it allows for several simultaneous experiments by local governments (Strumpf, 2002). According to this last line of reasoning municipalities learn from each other by experimenting with local policies and by benchmarking and transferring the results. In the end, this would lead to an optimal outcome through an ideal implementation scheme that would emerge from a local learning process.

The second reason has its origin among other things in the contingency theory of organizations, which assumes that in becoming efficient, organizations should adapt to different environments (Donaldson, 2001). It is well argued that local governments should be better equipped to adapt policy programmes to local needs and circumstances, which should make social policies more flexible and more effective (OECD, 2003; 1998). In situations where local policy responsibility is accompanied by financial responsibility, there is a clear incentive to perform better. Eventually this would enhance the efficiency. While both points lead to more efficiency, the underlying mechanisms are different.

Theoretically, it is also possible to think of a scenario in which efficiency improvements do not take place. In the neo-institutional organizational sociology, organizations do not pursue efficiency per se, simply because organisations do not always know what is effective, i.e. what is working and what is not. This certainly is true for 'weak technology' organisations such as schools and social welfare organizations. In absence of knowledge and information, such organisations accept practices that have legitimacy instead of an empirically proven efficiency. That does not mean that organisations act irrationally or do not formulate goals and specify ways to reach them but '... these beliefs are myths in the sense that they depend for their efficacy, for their reality, on the fact that they are widely shared, or are promulgated by individuals or groups that have been granted the right to determine such matters' (Scott & Meyer [1983], 1993: 1). In this social-constructionist point of view organizations behave according to normative and cultural guidelines. The outcome of this behaviour could be



that organizations converge “..around short-term behavioural equilibria that may be less efficient than rejected alternatives” (DiMaggio, 1998: 697).

Legitimacy instead of efficiency also plays a role in the political institutional point of view which introduces the concept of political conflict and path dependency. Here is organizational behaviour the result of political conflict which often leads to compromises at the end. This could lead organisations to accept goals that differ from the national of efficiency one (see for instance: Bredgaard et al. 2003). Furthermore, the fact that municipalities are democratically controlled organisations, with different political assemblies and priorities could lead to outcomes that are less efficient.

So there are arguments for more efficiency as a result of decentralisation, but there are also arguments for less efficiency, at least as an explanation for differences between municipalities.

#### **4. Frontier analysis**

When discussing the performance of firms or institutions it is common to describe this in terms of productive or cost efficiency. Efficiency is then determined by how close the actual production or costs of the firm or institution lie to the production or cost frontier. The efficient production frontier is determined by two conditions: (i) technical efficiency, i.e. minimum use of inputs, and (ii) allocative efficiency, i.e. optimal mix of inputs given relative factor prices. If duality between cost and production transformation processes is ensured by imposing regularity conditions on the production possibilities set, the efficient production frontier can be rewritten as an efficient cost frontier.<sup>1</sup>

The absence of technical or allocative efficiency (or both) necessarily leads to a departure from production maximization or cost minimization and therefore creates inefficiency. In this paper, we focus on municipal cost efficiencies with respect to their social assistance payments. The size of this cost efficiency is based on the difference between observed costs and predicted minimum costs for a given scale, a mix of relevant outputs and factor prices as explanatory variables. In other words, each municipality in the sample is benchmarked against the “best” municipality in the sample.

There are several methodologies and techniques to determine the efficiency of firms and institutions. Most of them are based on the use of simple indicators or on techniques, as e.g. Free Disposable Hull (FDH), Data Envelopment Analysis (DEA) or Stochastic Frontier Analysis (SFA). Non-parametric approaches to measuring efficiency, such as DEA and FDH have the advantage of imposing less structure on the frontier than do

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<sup>1</sup> These regularity conditions are a non-decreasing function with linear homogeneity and concavity in input prices.

parametric approaches, such as SFA. On the other hand, their drawback is their deterministic nature, i.e. not allowing for random errors caused by chance, data problems or other measurement errors.

#### 4.1. DEA

DEA is an analytical technique that can be used to assist in identifying best practice performance in the use of resources amongst a group of similar organisations (Decision Making Units – DMU). DEA started off with Farell (1957) and became more widespread with the work of Charnes et al. (1978). Seiford (1996) provides a review of the developments in DEA thereafter. Tools like DEA are useful in situations where government bodies operate in markets, which are distorted by regulated prices, subsidies and a lack of contestability. In these cases the usual market indicators of performance, like profitability and rates of return, cannot be used to gauge an institution's economic performance accurately. In these situations DEA provides a comparative monitoring that can identify variations in efficiency between organisations and may provide directions for performance improvement (cf. Abbott and Doucouliagos, 2003).

A key concept in DEA is the choice of DMUs as the entities responsible for converting inputs into outputs. Evidently, the choices of outputs and inputs are also important. It is not required, however, that functional forms which relate the inputs to the outputs be specified explicitly; it is also not required that weights be assigned to any of the inputs or outputs to reflect their supposed relative importance on an *a priori* basis.

In this paper, we apply DEA to explore technical efficiency of municipal costs of social assistance in The Netherlands. Technical efficiency means that an institution cannot produce more output from its existing inputs. In the case of municipalities' social assistance expenses, this means that the technically efficient municipality is not able cut more on social assistance costs, given its demographic and socio-economic characteristics. See also Charnes et al. (1989) who apply a DEA approach to Chinese cities.

Consider a world in which there are  $n$  municipalities, each using  $m$  inputs to produce  $s$  outputs. Denote by  $x_{i,j}$  the input  $i$  used by the  $j$ -th municipality, and let  $y_{r,j}$  denote the same municipality's output of type  $r$ . For each municipality, a linear programming model is solved, which chooses vectors of input and output weights so as to maximise efficiency (or equivalently minimise inefficiency), subject to relevant constraints. For municipality  $k$ , the variable returns to scale, input oriented, cost minimisation data envelopment problem can be expressed as

$$\begin{aligned}
& \min_{\lambda, x_k^*} \sum_{i=1}^m w_{i,k} x_{i,k}^* \\
& \text{s.t.} \quad -y_{k,r} + \sum_{j=1}^n \lambda_j y_{j,r} \\
& \quad \quad x_{i,k}^* - \sum_{j=1}^n \lambda_j x_{i,j} \\
& \quad \quad \lambda_j \geq 0 \\
& \quad \quad \sum_{j=1}^n \lambda_j = 1
\end{aligned} \tag{1}$$

where  $w_{i,k}$  is a vector of input weighs of municipality  $k$ ,  $\lambda_j$  is a vector of constants ( $j=1, \dots, n$ ) and  $x_{i,k}^*$  is the cost minimizing vector of input quantities of type  $i$  in municipality  $k$ , both calculated from the above linear programming problem, given  $w_i$  and output levels  $y_i$ .

The total cost efficiency (CE) of the  $k$ -th municipality is calculated as

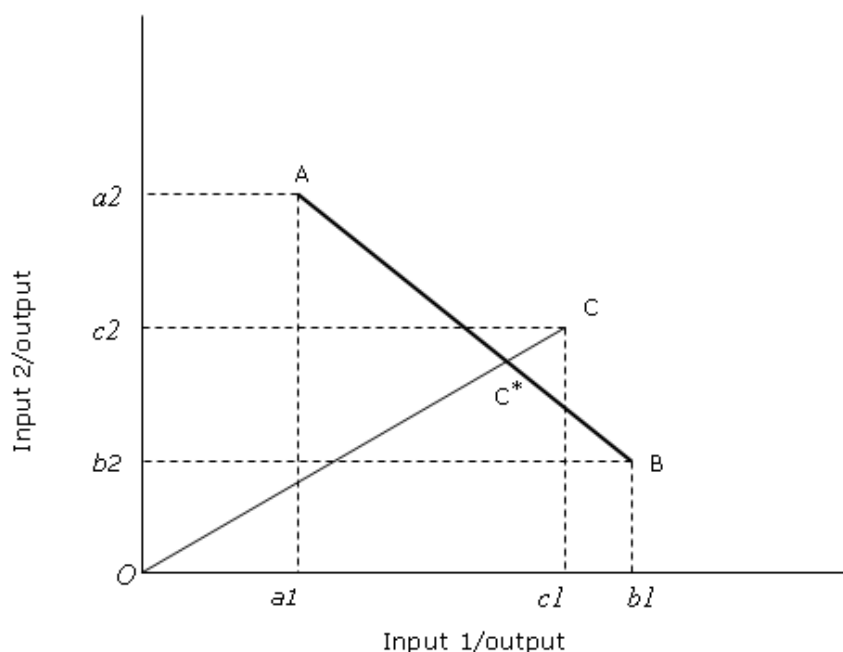
$$CE = \sum_{i=1}^m w_{i,k} x_{i,k}^* / \sum_{i=1}^m w_{i,k} x_{i,k} \tag{2}$$

It is useful at this stage to provide a more intuitive account of the DEA efficiency scores. Consider a problem in which just two inputs are used to produce one output. Suppose also that there municipalities labelled A, B and C. Let A use  $a1$  units of input 1 and  $a2$  units of input 2 to produce one unit of output; let B use  $b1$  units of input 1 and  $b2$  units of input 2 to produce the same quantity of output, with  $b1 > a1$  and  $b2 < a2$ . Finally let the usage of inputs 1 and 2 by C to produce one unit of output be denoted by  $c1$  and  $c2$  respectively, such that C is strictly to the right of the line segment AB. This is illustrated in figure 1 (cf. Johnes and Johnes, 1993)

There exist points on a line drawn between A and B in figure 2, which dominate C in the following sense: a linear combination of A and B (say  $C^*$ ) would allow a given output to be produced using less of each input than is employed by C. Therefore C cannot be technically efficient, even if the most favourable assumptions are made about the value (or weight) attached to each input. The line AB corresponds to the frontier and a radial measure of C's technical inefficiency, which corresponds to the efficiency score in (2), is the ratio  $OC^*/OC$ .

For more on DEA, we refer to Abbott and Doucouliagos (2003), Fried et al. (2002), Coelli (1996a), Johnes and Johnes (1993), Charnes et al. (1989) and the references therein.

**Figure 2. Schematic representation of DEA**



#### 4.2. SFA

Stochastic frontier analysis (SFA) was developed by Aigner et al. (1977) and has further been developed by Battese and Coelli (1992, 1995) and Coelli (1996b, 1999). Considering a cost function approach, like DEA, SFA is also applied to determine the efficiency of institutions (DMUs) that have undergone structural reforms and deregulations, such as banks (Maudos et al. 2001, Fries and Taci 2005), hospitals (Linna, 1998; Rosko, 2001) and utilities (Burns and Weyman-Jones, 1996; Ashton, 2000; Timmins, 2002; Farsi and Filippini, 2004). In a production function setting, SFA has been applied to assess new production methods (Stijn et al. 1999; van der Vlist and Folmer, 2009).

As argued, also local governments like municipalities have been subjected to structural reforms. This led to efficiency studies on the overall cost level of municipal services (vanden Eeckaut et al., 1993; De Borger, 1996) or specific privatised services (Pina and Torres, 2001). We will apply the SFA approach to determine the cost inefficiency of municipal social assistance expenditures.

SFA allows for a model with random errors, as opposed to DEA, which is a purely deterministic technique. The SFA assumes these errors to comprise (i) inefficiencies, following an asymmetric distribution, usually a truncated or half-normal distribution, and (ii) random errors following a symmetric distribution, usually the standard normal distribution. The reason for this particular structure of the composite error term is that, by definition, inefficiencies cannot be negative.

The municipalities' relative efficiency of social assistance expenditures using panel data is performed by estimating a cost function of the general form

$$y_{i,t} = \alpha + X'_{i,t}\beta + v_{i,t} + u_{i,t} \quad (3)$$

where  $y_{i,t}$  is the total expenditure on social assistance in municipality  $i$  ( $i=1,\dots,N$ ) in year  $t$  ( $t=1,\dots,T$ ) in logarithm.  $X_{i,t}$  is a matrix of (logs of) outputs and input prices. The  $v_{i,t}$ 's are random variables independently distributed  $N(0, \sigma_v^2)$  and independent from  $u_{i,t}$ . The  $u_{i,t} > 0$  represent technical efficiency and are independently distributed  $N(\mu_{it}, \sigma_u^2)$ .

To facilitate the use of maximum likelihood estimation (MLE), we follow the arguments of Battese and Coelli (1992) and replace  $\sigma_v^2$  and  $\sigma_u^2$  with  $\sigma^2 = \sigma_v^2 + \sigma_u^2$  and  $\gamma = \sigma_u^2 / \sigma_v^2 + \sigma_u^2$ . In order to allow efficiency scores from a SFA to vary across time, Battese and Coelli (1995) propose the use of a model where  $u_{i,t}$ 's are distributed as truncations at zero of the  $N(\mu_{it}, \sigma_u^2)$  distribution, where

$$u_{i,t} = Z_{i,t}\delta + \varepsilon_{i,t} \quad (4)$$

and where  $Z_{i,t}$  reflects a matrix of variables assuming to affect efficiency,  $\delta$  is a parameter vector and the error term  $\varepsilon_{i,t} \sim N(0, \sigma_\varepsilon^2)$  is truncated from below by the variable truncation point  $-Z_{i,t}\gamma$ . This way the inefficiency effects ( $u_{i,t}$ ) are expressed as an explicit function of cross-section specific variables (in  $Z_{i,t}$ ) and a random error. This system of a stochastic cost frontier and an explicit inefficiency function is estimated as a single-step procedure. Cost efficiency is calculated from equation (4) as  $EFF_i = \exp(-u_i)$  and will take on values between 1 and infinity. The cost inefficiency of cross section  $i$  is thus defined as  $1 - EFF_i$ .

## 5. Data

In our case we gathered data for all 443 municipalities in the Netherlands over the period of 2001-2007.<sup>2</sup> Most data we use are drawn from Statistics Netherlands. The exact sources and definitions are in the Appendix. The data on expenditures on social assistance comes from the Netherlands Ministry of Social Affairs.<sup>3</sup>

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<sup>2</sup> This means that any previous classifications of municipalities were regrouped into the 443 municipalities of 2007.

<sup>3</sup> For the period of 2004-2007 all expenditures are available at municipal level. For 2001-2003 municipalities working together in a joint social service with others (i.e. an Inter-Municipal Social Service, IMS) only information is available at that IMS-level. In those cases we have redistributed the information at municipal levels based on each municipal share of households in the total of the IMS.

In both the DEA and SFA, we consider the municipal social assistance expenditures as the dependent (or output) variable.<sup>4</sup> The inputs or elements of the *X*-matrix are identified as variables that determine the budgeted expenditures on social assistance. These municipal budgets are determined using objective variables not at the municipal's discretion<sup>5</sup>. The basic idea is that these objective variables determine to a large extent the inevitable burden of social assistance. These variables are e.g. the number of single-parent households, the share of non-Western minorities or regional job growth. The budgets are in fact very close to the actual expenditures and hence expenditures are closely related to these 'objective' factors that determine the budgets as well.

In the SFA we will use policy strategies municipalities can uphold to limit social assistance dependency (Broersma et al. 2009, Edzes et al. 2009). We will now elaborate on this issue. Each of these strategies can be identified by a number of indicators. Table 3 shows which indicators can be identified to reflect each strategy. The most intrinsic part of the control strategy is reflected by the share of detected fraud cases. Checking whether social assistance benefit recipients are not eligible for other social security arrangements will raise the influx in such measures as disability for those without work experience (Wajong) or as social work provision (WSW). An activation strategy comprises subsidised employment, where social assistance benefit recipients have a job for which the wage costs are covered by a subsidy<sup>6</sup> and non-subsidised courses, such as application courses. The employment strategy is reflected by the growth rate of the number of establishments, as result of municipal efforts to get favourable business conditions, and by the municipal expenses on economic affairs. Finally, co-operation is reflected by the extent to which municipal social services, who carry out social assistance, work together. The common period to which data are available on all these indicators is limited to the period 2005-2007. These strategy indicators will next be used to assess which strategy helps to reduce inefficiency of municipal social assistance payments, as in (4). This is why the SFA will be limited to 2005-2007. Since DEA is not about the effect of strategies, but instead on the possible effect of the introduction of the WSA in 2004, it is applied to the period 2001-2007.

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<sup>4</sup> After 2004, social assistance budgets comprise two parts: (i) an income part providing income support for the social assistance recipient and (ii) a work part providing (re-) integration support in order to be able to (re-)enter the labour market. Before 2004 this distinction was not made and there was only one budget, corresponding the income part. Our analysis refers only to the expenditures of the income part.

<sup>5</sup> This so-called objective dividing-model is gradually implemented and first been applied to the municipalities with over 60.000 inhabitants: in 2004 the total amount of budget that was objectively divided lies at 40%, in 2006 the full budget was objectively divided. For the smaller municipalities (in 2004: less than 40.000 inhabitants and from 2006 less than 30.000 inhabitants) the budgets were based on a historical division model. For the in between group (40.000-60.000 inhabitants) a mixture is chosen between an objective and a historical dividing model.

<sup>6</sup> This subsidy stems from the work part of the municipal social assistance budgets.

**Table 3. Four municipal policy strategies with respect to social Assistance, 2005-2007**

Municipal strategy	Short description	Indicators
Control (C1)	Threat; emphasis on fraud detection and research whether recipients are not eligible for other social arrangements	- Wajong-inflow* - WSW-inflow** - Fraud cases
Activate (A)	Emphasis on participation by entering into subsidized jobs or other courses	- Subsidized employment - Non-subsidised courses
Employment (E)	Emphasis on job creation by stimulus of new firms or by high municipal economic affairs outlays	- Growth rate of establishments - Expenditures on economic affairs
Co-ordination (C2)	Municipalities that have a joint social service with other municipalities	- IMS***

\* Wajong refers to the disability arrangement for young persons with no employment history

\*\* WSW refers to employment through social work provisions for disabled persons

\*\*\* IMS stands for Inter-Municipal Social service and is a dummy variable of 1 when a municipality joins such an IMS

As a next step we determine for each municipality whether it lies above or below the national average of each of the indicators.<sup>7</sup> This way we can create for each separate strategy and combination of strategies a dummy variable indicating a 1 for each municipality that lies above the national average in each of these options. Note that this means that all options are mutually exclusive, i.e., each municipality enters in one and only one strategy option. Table 4 shows the strategy options a municipality can have. Each option refers to (combinations of) strategies for which each municipality has an above national average score in 2005-2007.

**Table 4. Options of policy strategies and combinations**

No.	Strategies	Municipalities in 2005-2007	No.	Strategies	Municipalities in 2005-2007
1	None	711	10	A - C2	38
2	Control (C1)	69	11	E - C2	17
3	Activate (A)	119	12	C1- A - E	7
4	Employment (E)	69	13	C1- A -C2	9
5	Co-ordination (C2)	201	14	C1- E -C2	2
6	C1- A	28	15	A - E -C2	5
7	C1- E	22	16	C1- A -E - C2	0
8	C1- C2	16	17	All 2 combinations	137
9	A - E	19	18	All 3 combinations	23

<sup>7</sup> Of course this implies that each indicator is scaled to make it comparable across municipalities. Wajong- and WSW-inflow are scaled with the total municipal population between 15-64 years of age. Fraud cases are related to social assistance recipients. Subsidies employment and other, non-subsidised, activation courses are also scaled with the social assistance recipients. Annual growth of establishment is in percentages and Economic Affairs outlays are relative to the entire population. IMS is already a dummy variable.

Table 4 shows that in the period 2005-2007 each municipality will enter in one of the strategy options numbered 1 through 16. The municipalities in that period add up to a total of 1329, which means that each year all 443 municipalities are covered. Note that most municipalities have no focus on any of the strategies, i.e. their value on each the indicators for the policy strategies is below average. Note also that only a few municipalities focus on three strategies simultaneously and no one focuses on all four options. Since particularly the option of ensuing three strategies is very thin among municipalities, we have also looked at the combination of all strategies with three options, as well as the combination of all strategies with two options. That way the number of municipalities gets more in line with those ensuing one option in 2005-2007.

## 6. Empirical efficiency measures

This section shows the efficiency measures we found when applying DEA and SFA. DEA has been applied to municipal expenses on social assistance during the 2001-2007 period. SFA is conducted for the period 2005-2007 assuming the policy strategies of table 4 affect efficiency.

DEA is a deterministic and non-parametric analytical approach where linear programming determines the efficiency. We apply the DEA-program of Coelli (1996a), where output is municipal social assistance expenditures and the inputs comprise 8 inputs, based on the demographic and socio-economic variables that determine the municipal social assistance budget: (i) household with a low income, (ii) single parent households, (iii) non-Western minorities, (iv) inhabitants with an unemployment insurance benefit, (v) inhabitants with a low education, (vi) vacancy-unemployment ratio of the NUTS-3 region the municipality is in, (vii) number of municipal jobs and (viii) address density, as urbanisation measure.

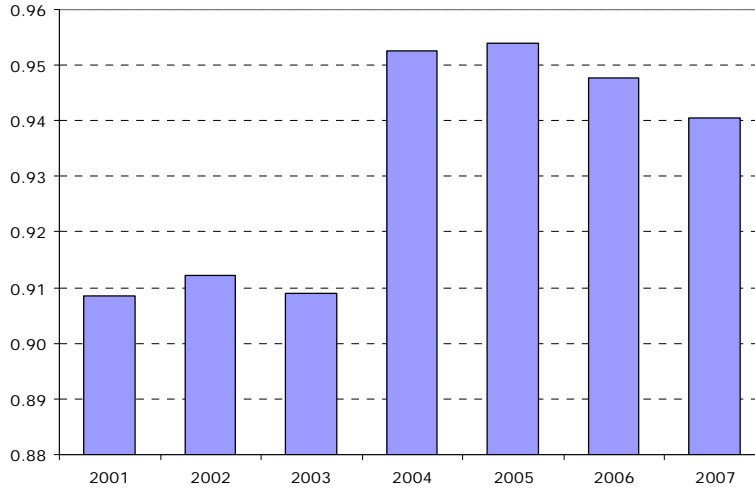
Figure 3 gives the average annual efficiency of municipal social assistance expenses between 2001 and 2007, based on the above DEA setting. Clearly the pattern of the efficiency over time shows a break in 2004. We also did the same analysis using additional inputs and using fewer inputs, but apart from a slight change in the average efficiency level, the pattern over time, a break in 2004, remained the same. This provides evidence in favour of the premise that introduction of the WSA has raised efficiency with which municipalities carry out the social assistance. Efficiency rose from 91% in the period 2001-2003 to 95% in the period 2004-2007, or 4%-points between 2003 and 2004.<sup>8</sup> Efficiency of social assistance expenses is on average already quite high in The Netherlands. Also note the downward trend in efficiency after 2005.

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<sup>8</sup> The Netherlands Bureau for Economic Policy Analysis (CPB 2006) finds that the introduction of the WSA led to a decline in the number of benefit recipients of 8000 cases. Given a social assistance recipient costs on average € 13,000 per year (table 1), a loss of 8000 cases means a decline of almost 3% in social assistance costs.



**Figure 3. Average municipal efficiency of social assistance expenses in The Netherlands, 2001-2007 (DEA)**



We will next focus on the outcome of the SFA for the period 2005-2007 and assess if certain policy strategies can be connected to the falling efficiency pattern during that period. As a first step we specify our cost frontier model. This comprises a cost model, representing the  $X$ -variables of equation (3) and the strategy variables of equation (4), representing cost *inefficiency*. This model is specified as<sup>9</sup>.

$$\begin{aligned} \log(SAC_{i,t}) = & \beta_{0,t} + \beta_1 \log(HH_{low-inc,i,t}) + \beta_2 \log(HH_{single-par,i,t}) + \beta_3 \log(POP_{minor,i,t}) + \\ & + \beta_4 \log(POP_{unem-insur,i,t}) + \beta_5 \log(POP_{low-edu,i,t}) + \beta_6 \log(V/U)_{i,t} + \\ & + \beta_7 \log(A/S)_{i,t} + \beta_8 \log(Jobs_{empl,i,t}) + \sum_{i=9}^{11} \beta_i D_{region,i-7} + \sum_{i=12}^{14} \beta_i D_{size,i-10} + e_{i,t} \end{aligned} \quad (5)$$

where  $SAC_{i,t}$  are the social assistance expenses of municipality  $i$  in period  $t$ . The  $\beta_0$  represents period fixed effects, the other  $\beta$ 's are parameters.<sup>10</sup>  $HH$  represents households with specific characteristics (low income or single parent),  $POP$  refers to number of inhabitants with certain characteristics (non-Western minority, on unemployment insurance benefit or low educated).  $V/U$  refers to the vacancy-unemployment ratio of the NUTS3-level the municipality is in as measure of labour market tightness,  $A/S$  is the number of addresses ( $A$ ) per km<sup>2</sup> municipal surface ( $S$ ), which serves as measure of urbanisation.  $Jobs$  represents the number of jobs of employees working in the municipality and finally  $D$  refers to a

<sup>9</sup> The model specification in (3) represents the variables of the simplified model. We adopt a modelling strategy of moving from general to specific. The general models contains additional variables that could validly be deleted from our model. The estimation results of this general model are available upon request.

<sup>10</sup> Cross-section fixed effects were not considered. Instead we focus on the effects that particular groupings of municipalities might have, linked to regional location and size.

number of control dummy variables reflecting municipal characteristics, viz. the NUTS1-region it is in and the size class it belongs to.<sup>11</sup>

The error process in (5) is represented by  $e_{i,t}$ , which in the setting of a cost frontier becomes  $e_{i,t} = v_{i,t} + u_{i,t}$ . Like in (1), the  $v_{i,t}$ 's are iid random variables following a  $N(0, \sigma_v^2)$  distribution and the  $u_{i,t} > 0$  are iid distributed  $N(\mu_{i,t}, \sigma_u^2)$ . The  $u_{i,t}$ , represent the efficiency process and are assumed to depend on policy strategies municipalities have, is represented as

$$u_{i,t} = \delta_0 + \sum_{j=1}^N \delta_j D_{policy-strat,j} + \varepsilon_{i,t} \quad (6)$$

where  $D_{policy-strat,j}$  reflects the various municipal policy options of table 4. Note that the current specification of (6) includes all possible options for strategies or combinations thereof, as in table 4. We already argued that only very few municipalities have focused on a combination of 2 and 3 different strategies, so the most natural solution to this is to add all 2- and 3-combinations into one. The choice of variables entering the cost frontier model will be part of a sensitivity analysis of our model specification and subsequent efficiency measures. The efficiency pattern we found with the SFA for the period 2005-2007 appears to be quite stable when changing the explanatory and policy variables of the model. Another reassuring thought is that the efficiency pattern we found with SFA for 2005-2007 is very similar to downward trend found with DEA for those years.

The cost frontier model presented in table 5, shows that period specific effects are not significantly different from zero and could hence validly be omitted from the model. We find all the  $X$ -variables in (3) to be highly significant. From the inefficiency part of the model, we find mixed results. The strongest negative effect on *inefficiency*, i.e. the largest positive effect on efficiency, is exerted by a policy strategy of activating social assistance recipients. On the other hand, some combinations of policy strategies have a worsening effect on efficiency, notably combinations of control and employment and of control, activation and co-ordination. However, as argued these combinations are best taken together and in that case we only find that combinations of two strategies have a positive effect on *inefficiency* (i.e. a negative effect on efficiency). And when all possible combinations of strategies are considered, only a weak effect remains.

Figure 4 shows the average municipal efficiency score for the years 2005-2007, based on the estimations in the final column of table 5. Clearly the downward trend from figure 3 for the period after 2004 is corroborated. The overall efficiency level, of roughly 95%, is however very high. In fact the non-discretionary  $X$ -variables in the frontier models of table 5 already explain a lot of the variation in social assistance costs.<sup>12</sup>

<sup>11</sup> Four size classes are distinguished: (i) more than 100.000 inhabitants, (ii) 50.000-100.000 inhabitants, (iii) 20.000-50.000 inhabitants and (iv) less than 20.000 inhabitants.

<sup>12</sup> A simple regression of social assistance costs on the  $X$ -variables, without the policy strategies, had an adjusted  $R^2$  of 096.

**Table 5. Estimation results of social assistance cost frontier model, 2005-2007**

	Yes	No	No	No
Fixed effects (period)				
Constant	9.019***	9.099***	9.138***	9.135***
Log(HH_low income)	0.713***	0.721***	0.723***	0.723***
Log(HH_single parent)	0.590***	0.607***	0.605***	0.605***
Log(POP_minority)	0.154***	0.152***	0.152***	0.153***
Log(POP_unempl. insurance)	0.189***	0.174***	0.173***	0.172***
Log(POP_low edu.)	-0.120***	-0.123***	-0.128***	-0.127***
Log(Vacancy/Unemployment)	-0.192***	-0.170***	-0.172***	-0.171***
Log(Jobs)	-0.223***	-0.227***	-0.223***	-0.223***
Log(Addresses/km <sup>2</sup> )	0.110***	0.109***	0.109***	0.108***
NORTH	0.177***	0.187***	0.185***	0.187***
WEST	0.163***	-0.168***	-0.175***	-0.175***
SIZE >100k	-0.376***	-0.382***	-0.370***	-0.370***
SIZE 50-100k	-0.190***	-0.191***	-0.181***	-0.184***
SIZE 20-50k	-0.211***	-0.211***	-0.207***	-0.207***
Inefficiency model				
No specific strategy	0.010	0.001	0.021	0.022
C1	0.104*	0.110**	0.094*	0.094*
A	-0.212*	-0.274***	-0.298***	-0.316***
E	-0.072	0.022	-0.038	-0.029
C2	0.032	0.029	0.028	0.026
C1-A	0.110	0.122*		
C1-E	0.169**	0.180**		
C1-C2	0.093	0.113		
A-E	0.037	0.050		
A-C2	-0.067	0.018		
E-C2	-0.258	-0.089		
C1-A-E	0.117	0.133		
C1-A-C2	0.219**	0.238**		
C1-E-C2	0.146	0.174		
A-E-C2	0.109	0.120		
All combinations of 2 strategies			0.153**	
All combinations of 3 strategies			0.060	
All possible combinations				0.073*
$\sigma^2$	0.057**	0.056***	0.057***	0.057***
$\gamma$	0.028	0.020***	0.020***	0.023***
Log-likelihood	294.7	551.1	44.44	42.53
Number of observations	1329	1329	1329	1329
Number of cross-sections	443	443	443	443
Number of time periods	3	3	3	3

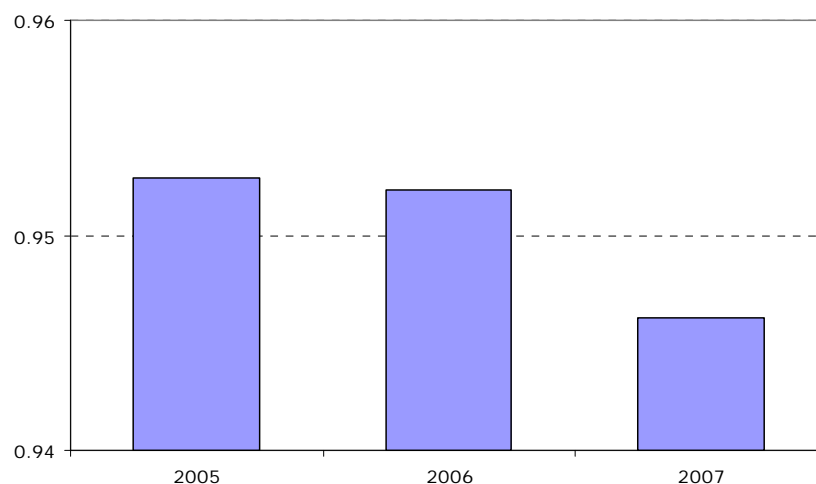
\* significance at 10%

\*\* significance at 5%

\*\*\* significance at 1%

Note: In order to remove large outliers, the specifications comprise seven dummies.

**Figure 4. Average municipal efficiency of social assistance expenses in The Netherlands, 2005-2007 (SFA)**



## 7. Developments in cost efficiency

Three conclusions can be drawn from our DEA and SFA. First, the average efficiency levels of social assistance costs in The Netherlands are very high. Second, introduction of the WSA in 2004 raised cost efficiency. Third, the downward trend in efficiency after 2004 can be related to different policy strategies municipalities adopt. Table 6 gives a review of the efficiency effects of the various policy strategies we have distinguished.

**Table 6. Efficiency by type of policy strategy, 2005-2007**

Strategy	mean	s.d.	range	Strategy	mean	s.d.	range
None	0.963	0.003	0.970-0.956	A - C2	0.915	0.005	0.924-0.903
Control (C1)	0.877	0.005	0.896-0.869	E - C2	0.916	0.006	0.925-0.902
Activate (A)	0.997	0.002	1.000-0.996	C1- A - E	0.811	0.005	0.815-0.803
Employment (E)	0.978	0.001	0.981-0.976	C1- A -C2	0.808	0.004	0.815-0.803
Co-ordination (C2)	0.944	0.004	0.957-0.930	C1- E -C2	0.810	0.007	0.815-0.805
C1- A	0.913	0.004	0.921-0.904	A - E -C2	0.811	0.005	0.817-0.804
C1- E	0.912	0.004	0.918-0.905	All 2 combinations	0.914	0.005	0.925-0.902
C1- C2	0.913	0.004	0.919-0.906	All 3 combinations	0.810	0.005	0.817-0.803
A - E	0.915	0.004	0.923-0.907	All combinations	0.899	0.037	0.925-0.803

Note: s.d. stands for standard deviation, as a measure of spread of efficiency, the range provides the maximum and minimum efficiencies

Note that particularly the case of adopting three strategies simultaneously has a lower efficiency. However, we saw that only few municipalities opt for this. Also a combination of two strategies, irrespective of the options, has a lower efficiency than having no strategy. As observed from table 5 and 6, only a strategy of activation (A) raises efficiency significantly. However, table 6 also shows that an employment strategy has a positive effect on efficiency as well. On the other hand, a focus on control between 2005 and 2007 lowered efficiency.

One of the reasons for the negative effect of control as strategy on social assistance costs, is the fact that 2005-2007 was a period of strong job growth following the 2002-2003 recession. Particularly the growth in 2007 stood out, which was marked as a year in which municipalities reached the so-called hard core of their stock of social assistance recipients.<sup>13</sup> Many recipients moved to employment and in these circumstances control is likely not as effective as in less favourable periods.

A plausible reason for the strong positive impact of activation as policy strategy, is the fact that the employment inflow of social assistance recipients, is strongly linked to subsidised employment programmes and other courses that recipients were engaged in. When finding employment via subsidised employment or non-subsidised courses, the recipient is leaving the social assistance administration. So from the perspective of social assistance expenditures, both types are efficient. From the perspective of overall active labour market costs, the costs of subsidised employment are a mere substitute of social assistance costs.<sup>14</sup> Only when subsidised employment is temporarily, it contributes to the efficiency of social assistance expenditures.

However, this does not mean that for future developments in efficiency, municipalities should pursue a strategy of activation. In the period 2005-2007, this might have raised cost efficiency, but in other periods there might be other strategies, or combinations thereof, that work, as the cost frontier will also change.

Next we show the variation in efficiency changes between 2001-2004 and between 2004-2007, to again show the effect of the WSA. Figure 5 shows that municipalities with a relatively large rise (decline) in efficiency in the period 2001-2004 experience a fall (rise) in efficiency in the period 2004-2007. This figure clearly also shows the rise in efficiency between 2001 and 2004, as most municipalities are on the positive side of the X-axis. The negative trend after 2004 is also visible as most municipalities are also on the negative side of the Y-axis.

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<sup>13</sup> See the evaluation of the model for dividing the social assistance budgets among municipalities in SEO/Andersson Elffers Felix (2008).

<sup>14</sup> Money from the income part (from which the benefit is paid) is substituted for money from the work part (from which wage subsidies are paid).

**Figure 5. Comparing differences in municipal efficiencies, 2002-2004 and 2004-2007 (DEA)**



In the country maps in figure 6 we can see that the pattern in figure 5 has a geographical dimension. The regions in the Netherlands that show a below average in efficiency in 2001 – mainly in the north and in the south – have an increasing efficiency in the period of 2001-2007.

**Figure 6. Comparing differences in municipal efficiencies, 2001 and difference between 2001-2007 (DEA)**

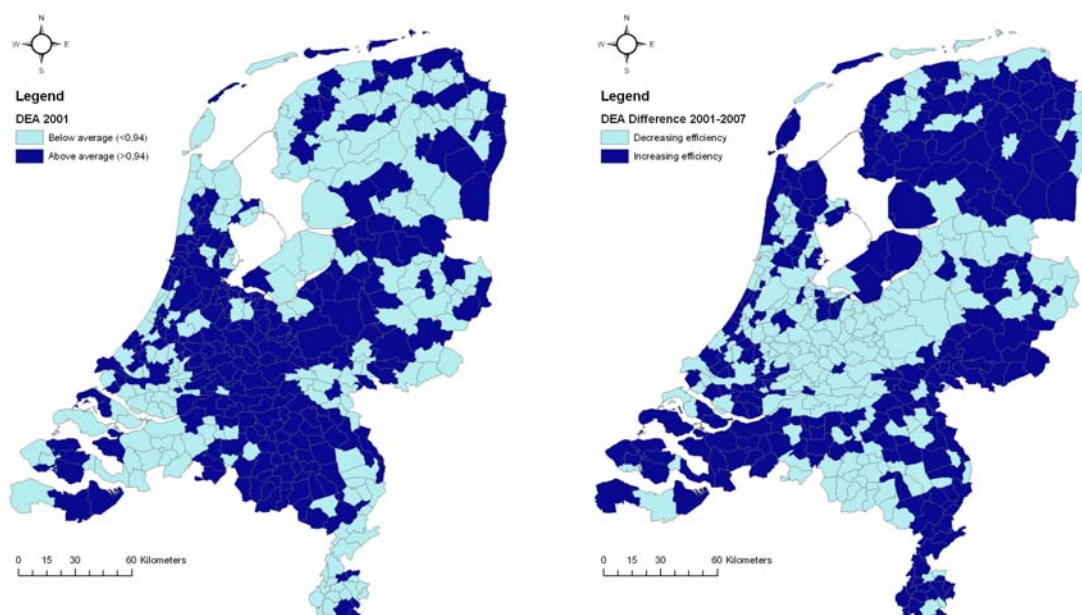
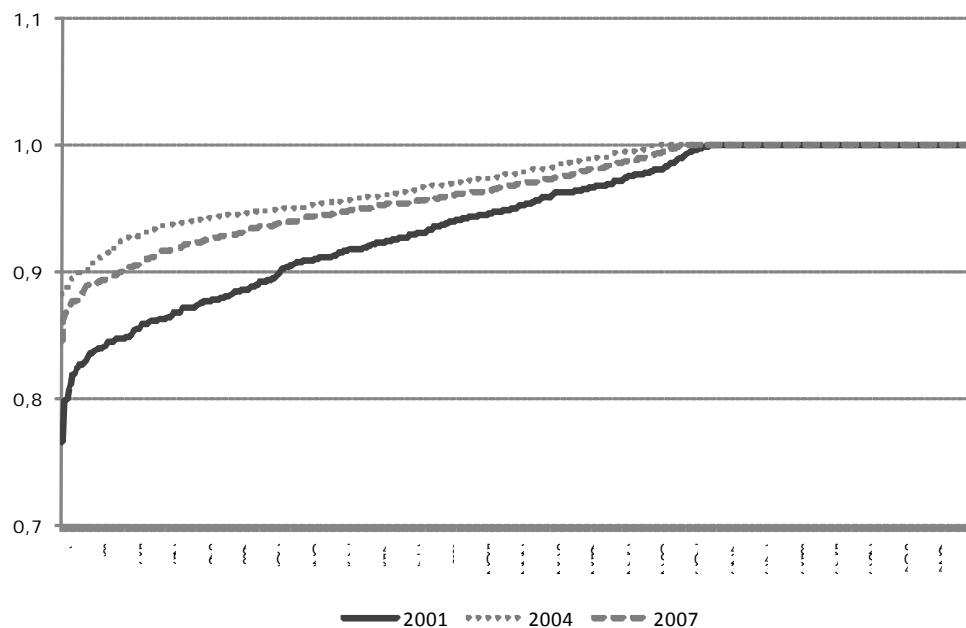


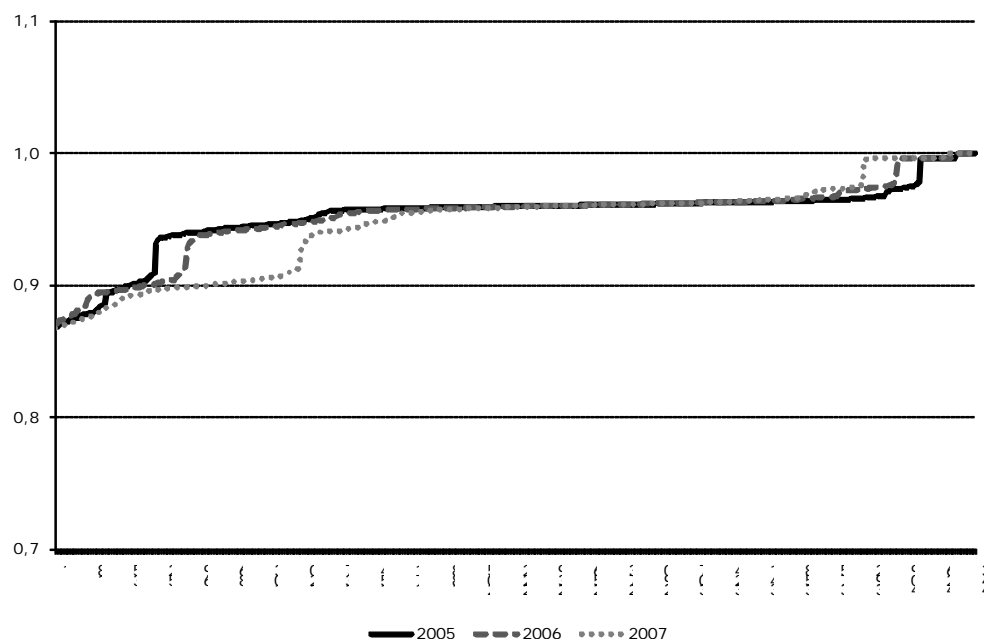
Figure 7 and 8 show the distribution of the efficiency scores from the DEA and SFA, respectively. Figure 7 compares the efficiency distribution of municipalities for 2001, 2004 and 2007. This figure shows that the number of municipalities operating on the cost frontier is fairly constant at about 30%. Moreover, these are also largely the same municipalities. Efficiency peaks in 2004 and falls between 2004 and 2007 on all points.

**Figure 7. Municipal efficiency distributions 2001, 2004 and 2007 from DEA**



For the period 2005-2007, we consider the efficiencies from the SFA. We now do find differences at both lower and higher ends of the distribution of efficiency for the three years we could take into account. Comparing 2005 with 2006 and particularly 2007, shows that efficiency at the lower end of the distributions deteriorated. On the other hand, comparing these same years at the higher end yields exactly the opposite. Now, efficiency in both 2006 and 2007 improved compared to 2005. However, overall the deterioration outweighed the improvement.

**Figure 8. Municipal efficiency distributions 2005-2007, from SFA**



These distribution changes of figure 8 imply that municipalities do change places and this partly depends on their policy strategies. What has happened between 2005 and 2007 is that many municipalities abandoned the option for not pursuing a particular strategy. The number of municipalities with no particular strategy dropped from 272 in 2005 to 199 in 2007. The number of municipalities with a control strategy rose from 23 in 2005 to 30 in 2007. Something similar happened with combinations of strategies, rising between 2005 and 2007 from 24 to 88 municipalities. This caused the deterioration at the lower end of the distribution in those years. At the same time the number of municipalities adopting an activation strategy doubled from 27 in 2005 to 54 in 2007. This improved the higher end of the efficiency distribution.

Do note however that these strategies only work for the cost frontier of 2005-2007. In an other period there will be another cost frontier in which other strategies may affect efficiency positively. So adopting a strategy of activation is no guarantee for future efficiency improvement.

## 8. Conclusions

The past 15 years Dutch reforms in the legislation and administration of welfare and social assistance benefits shifted competence and financial responsibility from the national government to the local level of municipalities. As far as social assistance is concerned, these reforms culminated in the Work and Social Assistance Act (WSA) in 2004. Although municipalities do not have the authority to change the actual benefit level,



they can develop their own local or regional policies, like co-operation, preventing unemployment, re-integration measures, gatekeepers-roles and so on. The gradual budgeting of the financial means for social assistance from 2001 to 2004, culminating in budgeting 100% of the costs of social assistance and re-integration to municipalities should give them enough incentives to act efficiently. So, the research question is whether Dutch municipalities have become more efficient in managing the costs of social assistance dependency.

In our analyses we considered two time periods and two approaches to determine efficiency. The periods we consider are 2001-2007 and 2005-2007. With the first period we want to assess whether introduction of the WSA in 2004 made a difference in cost efficiency. With the second period we want to assess which type of municipal policy strategies related to social assistance helped to improve cost efficiency. The reason why these strategies will only be considered in the short sample is the fact that adequate indicators for municipal strategies are not available before 2005. The efficiency effects of these strategies are analysed using a stochastic frontier analysis (SFA). For the long sample of 2001-2007, such strategies cannot be identified and hence focus is on a mere efficiency effect of the introduction of the WSA in 2004. For this we applied the data envelopment analysis (DEA). From both analyses the following conclusions can be drawn.

First, DEA shows a clear break in cost efficiency in 2004. Hence the WSA did improve municipal cost efficiency of social assistance. After 2004 the improvement slowly seems to leak away. The outcome of the DEA was very robust for other inputs used in the analysis. Second, SFA shows that municipal policy strategies do matter in improving cost efficiency of social assistance. We found that in the period 2005-2007 particularly a strategy of activating social assistance benefit recipients improved efficiency. Other strategies, notably control and combinations of different strategies, had a dampening effect on cost efficiency. In addition, we can also conclude that efficiency is already very high in The Netherlands with a value around 95%. Hence, there is influence of municipal policy, as we have seen, but this influence is small. After all, about 95% of the social assistance expenditures in the period 2005-2007 are determined by the inputs, i.e., factors that are not directly at their discretion. This confirms our research of the total policy effects on the in- and outflow of social assistance (Broersma et al, 2009). Because of that, the margins at which efficiency improvement could take place are very small.

## References

- Abbott, M. and C. Doucouliagos (2003). The efficiency of Australian universities: a data envelopment analysis. *Economics of Education Review*, 22, 89-97.
- Aigner, D.J. Lovell, C.A.K. Schmidt, P. (1977). Specification and estimation of frontier production, profit and cost functions. *Journal of Econometrics* 25, 21–37.
- Ashton, J.K. (2000). Cost efficiency in the UK water and sewerage industry. *Applied Economics Letters*, 7, 7, 455-458.
- Battese, G.E. and T.J. Coelli (1992). Frontier production functions, technical efficiency and panel data: with an application to paddy farmers in India. *Journal of Productivity Analysis*, 3, 33, 153-169.
- Battese, G.E. and T.J. Coelli (1995). A model for technical inefficiency effects in a stochastic frontier production function for panel data. *Empirical Economics*, 20, 325-332.
- Berkel, R. van (2006). The decentralisation of social assistance in The Netherlands. *International Journal of sociology and Social Policy*, 26, 20-31.
- Berkel, R. van & V. Borghi (2007). New modes of governance in activation policies. *International Journal of Sociology and Social policy*, 27, 7/8, pp. 277-286.
- Borghi, V. & R. van Berkel (2007). *Contextualizing new modes of governance*. International Journal of Sociology and Social Policy, 27, 9/10. pp. 353-363.
- Bosselaar, H., D. Bannink, C. van Deursen & W. Trommel (2007). *Werkt de Wwb? Resultaten van de ontwikkeling van nieuwe verhoudingen tussen rijk en gemeenten*. Utrecht: Meccano i.s.m. de Universiteit Twente en BSZ beleidsonderzoek.
- Brandt, N., J.M. Burniaux & R. Duval (2005). *Assessing the OECD jobs strategy: past developments and reforms*. Paris: OECD.
- Bredgaard, T., L. Dalsgaard & F. Larsen (2003). *An alternative approach for studying public policy: The case of municipal implementation of active labour market policy in Denmark*. Aalborg: Aalborg University.
- Broersma, L., A.J.E. Edzes & J. van Dijk (2009). *The effect of municipal policy strategies on in- and outflow of social assistance in The Netherlands 1999-2007*. Paper presented at the 2009 ERS Conference in Lodz. August 25-29 2009.
- Burns, P. & T.G. Weyman-Jones (1996). Cost functions and cost efficiency in electricity distribution: a stochastic frontier approach. *Bulletin of Economic Research*, 48, 1, 41-64.
- Carcillo, S. & D. Grubb (2006). *From inactivity to work: the role of active labour market policies*. Paris: OECD.
- Charnes, A, W.W. Cooper and E. Rhodes (1978). Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2(6), 429-444.
- Charnes, A, W.W. Cooper and S. Li (1989). Using data envelopment analysis to evaluate efficiency in the economic performance of Chinese cities. *Socio-Economic Planning and Science*, 23(6), 325-344.
- Coelli, T.J. (1996a). A guide to DEAP version 2.1.: a data envelopment (computer) program. CEPA Working papers No. 8. University of New England, Armidale, Australia.
- Coelli, T.J. (1996b). A guide to FRONTIER version 4.1.: a computer program for stochastic frontier production and cost function estimation. CEPA Working papers No. 7. University of New England, Armidale, Australia.
- Coelli, T.J. (1999). *Frontier – A maximum likelihood estimator for the parameters of frontier regression models*. <http://www.uq.edu.au/~uqcoell/frontier.htm>.
- Couto, A. & D.J. Graham (2009) The determinants of efficiency and productivity in European railways. *Applied Economics*, 41, 2827-2851.
- CPB (Netherlands Bureau of Economic Policy Analysis) (2006). *Wet Werk en Bijstand: een eerste kwantificering van effecten*. The Hague: CPB.

- Dam, M. van (1992). *Regio zonder regie: verschillen in en effectiviteit van gemeentelijk arbeidsmarktbeleid*. Groningen: ICS.
- Dam, M. van & S.A.H. Denters (1993). De effectiviteit van gemeentelijk arbeidsmarktbeleid. *Beleidswetenschap*, 7, 141-157.
- De Borger, B. & K. Kerstens (1996). Cost efficiency of local Belgian governments: a comparative analysis of FDH, DEA, and econometric approaches. *Regional Science and Urban Economics*, 26, 145-170.
- DiMaggio, P.J. (1998). The new institutionalisms: avenues of collaboration. *Journal of Institutional and theoretical economics*, 154, 696-706.
- Donaldson, L. (2001). *The contingency theory of organizations*. London: Sage publications.
- Edzes, A.J.E., L. Broersma & J. van Dijk (2009). *Arbeidsmarktstrategieën van gemeenten*. Groningen: RUG.
- Edzes, A.J.E. (2008). Arbeidsmarktpolitiek van gemeenten. *Tijdschrift voor Arbeidsmarktvraagstukken*, 41, 1, 53-67.
- Ekkehard, E. (2008). *Coping with labour shortages: how to bring outsiders back to the labour market*. Paris: OECD.
- Farrell, M.J. (1957). The measurement of productive efficiency. *Journal of the Royal Statistical Society Series A*, 120 (part3), 253-290.
- Farsi, M. and M. Filippini (2004). Regulation and measuring cost efficiency with panel data models: application to electricity distribution utilities. *Review of Industrial Organisation*, 25, 1, 1-19.
- Fried, H.O. C.A.K. Lovell, S.S. Schmidt and S. Yaisawarng (2002). Accounting for environmental effects and statistical noise in data envelopment analysis. *Journal of Productivity Analysis*, 17, 157-174.
- Fries, S. & A. Taci (2005). Cost efficiency of banks in transition: evidence from 289 banks in 15 post-communist countries. *Journal of Banking and Finance*, 29, 55-81.
- Geuns, R. van & M. van Gent (2007). *The new Work and Social Assistance Act (WWB)*. EU Peer review: discussion paper.
- Hall, P.A. & P.C.R. Taylor (1996). Political science and the three new institutionalisms. *Political studies*, 44, 936-957.
- IBO (Interdepartementaal Beleidsonderzoek financieringssysteem Algemene Bijstandswet) (1996). *Financieringssysteem algemene bijstandswet*. Den Haag.
- Johnes G. and J. Johnnes (1993). Measuring the research performance of UK economics departments: an application of data envelopment analysis. *Oxford Economic Papers*, 45, 322-347.
- Kluve, J. et al. (2007). *Active labour market policies in Europe: performances and perspectives*. Essen: Springer.
- Koning, J. de (2003). *Wat niet weet, wat niet deert: over de decentralisatie en uitbesteding van het arbeidsmarktbeleid*. Rotterdam: Erasmus Universiteit.
- Koning, J. de eds. (2007). *The evaluation of active labour market policies: measures, public private partnerships and benchmarking*. Cheltenham: Edward Elgar Publishing.
- Linna, M. (1998). Measuring hospital cost efficiency with panel data models. *Health Economics*, 7, 415-427.
- Lødemel, I. & H. Tricky ed. (2000). *An offer you can't refuse: workfare in international perspective*. Bristol: Policy Press.
- Martin, J.P. & D. Grubb (2001). *What works and for whom: a review of OECD countries' experiences with active labour market policies*. Stockholm: Office of labour market policy evaluation.

- Maudos, J., J.M. Pastor, F. Perez & J. Quesada (2001). Cost and profit efficiency in European banks. *Journal of International Financial Markets, Institutions and Money*, 12, 1, 33-58.
- OECD (2003). *Managing decentralisation: a new role for labour market policy*. Paris: OECD.
- OECD (1998). *Local management for more effective employment policies*. Paris: OECD.
- OECD (1999). *The local dimension of welfare to work: an international survey*. Paris: OECD.
- Pitt, M.M. & L.F. Lee (1981). The measurement and sources of technical inefficiency in the Indonesian weaving industry. *Journal of Development Economics*, 9, 1, 43-64.
- Pina, V. & L. Torres (2001). Analysis of the efficiency of local government service delivery: an application to urban public transport. *Transportation Research Part A: Policy and Practice*, 35, 10, 929-944.
- Ridder, H.G., H.J. Bruns & F. Spier (2005) Analysis of public management change processes: the case of local government accounting reforms in Germany. *Public administration*, 83, 2, 443-471.
- Rosko, M.D. (2001). Cost efficiency of US hospitals: a stochastic frontier approach. *Health Economics*, 10, 6, 539-551.
- Seinford, L.M. (1996). Data envelopment analysis: the evolution and the state of the art (1978-1995). *Journal of Productivity Analysis*, 7, 99-137.
- Stijn, R., C.A. Knox-Lovell & G. Thijssen (1999). Econometric Estimation of Technical and Environmental Efficiency: An Application to Dutch Dairy Farm. *American Journal of Agricultural Economics*, 81, 1, 44-60.
- Strumpf, K.S. (2002). Does government decentralization increase policy innovation. *Journal of Public Economic Theory*, 4 (2), 207-241.
- Scott, W.R. (2001). *Institutions & organizations*. London: Sage Publications.
- Scott, W.R. & J.W. Meyer ([1983] 1991). *The organization of societal sectors: propositions and early evidence*. Powell, W.W. & P.J. DiMaggio eds. (1991). *The new institutionalism in organizational analysis*. Chicago/London: University of Chicago Press.
- SEO/Andersson Elffers Felix (2008). *Evaluatie verdeelmodel Wet werk en bijstand*. SEO-Report 2008-13, Amsterdam: SEO.
- Ter Bogt, H.J. (2008). Management Accounting Change and New Public Management in Local Government: A Reassessment of Ambitions and Results?. *Financial Accountability & Management*, 24, 3, pp. 209-241.
- Tergeist, P. & D. Grubb (2006). *Activation strategies and the performance of employment services in Germany. the Netherlands and the United Kingdom*. Paris: OECD.
- Timmins, C. (2002). Measuring the Dynamic Efficiency Costs of Regulators' Preferences: Municipal Water Utilities in the ARID West. *Econometrica*, 70, 2, 603-629.
- Tweede Kamer der Staten Generaal (1999). *Wet Financiering Abw. Ioaw. Ioaz: Memorie van Toelichting*. Den Haag: Ministerie van Sociale Zaken en Werkgelegenheid.
- Vanden Eeckaut, P., H. Tulkens & M.A. Jamar (1993). Cost efficiency in Belgian municipalities. In: H.O. Fried, C.A. Knox Lovell & S.S. Schmidt (eds). *The Measurement of Productive Efficiency*. Oxford: Oxford University Press.
- Van Gestel, N., P. de Beer & M van der Meer (2009). *Het hervormingsmoeras van de verzorgingsstaat: veranderingen in de organisatie van de sociale zekerheid*. Amsterdam: Amsterdam University Press.
- Van der Vlist, A.J. & H. Folmer (2009). Environmental technology and management in Dutch horticulture. *International Journal of Environmental Technology and Management*, 11, 1/2/3, 207-217.

## Data appendix – Model variables

Name	Short description	Source
Expenditures social assistance 2004-2007	Total of expenditures on social assistance to persons < 65 years of age. all municipalities	Ministry of Social Affairs
Expenditures social assistance 2001-2003	25% expenditures on social assistance to persons < 65 years of age. all municipalities	Ministry of Social Affairs
Single-parent households	Share of single parent households in total number of households	Statistics Netherlands
Minorities	Share of minorities of non-Western descent in total population	Statistics Netherlands
Low incomes	Share of households with income at the lowest 4 deciles of the national income distribution	Statistics Netherlands
House value	Total house value as share of total housing stock	Statistics Netherlands
Low educated	Share population between 15-64 with a low education (at most ISCED 3)	Statistics Netherlands
Unemployment insurance	Share of persons between 15-64 with a UI benefit	Statistics Netherlands
VU-ratio	Ratio of vacancies and unemployed labour force in the corop-region (NUTS3) the municipality is in	Statistics Netherlands
Employment function	Ratio of jobs and the population between 15-64	Statistics Netherlands
Address density	Number of addresses per km <sup>2</sup>	Statistics Netherlands
Fraud cases	Share of fraud cases in average number of persons on social assistance	Divosa and Statistics Netherlands
Inflow Wajong	Ratio of inflow in Wajong arrangement and population between 15-64 (at start of period)	Statistics Netherlands
Inflow WSW	Ratio of inflow in WSW and population between 15-64 (at start of period)	Ministry of Social Affairs and Statistics Netherlands
Re-integration courses	Ratio of re-integration courses and population between 15-64	Statistics Netherlands
Subsidised re-integration courses	Ratio of subsidised re-integration courses and population between 15-64	Statistics Netherlands
Ranged of external co-operation	Number of external parties a municipality is co-operating with in terms of local labour markets	Divosa
Ranged of internal co-operation	Number of internal departments a municipality is co-operating with in terms of local labour markets	Divosa